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PTO/SB/05 (4/98)

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**UTILITY  
PATENT APPLICATION  
TRANSMITTAL**

(Only for new nonprovisional applications under 37 C.F.R. § 1.53(b))

Attorney Docket No	204,758
First Inventor or Application Identifier	Heinz FOCKE
Title	PROCESS AND APPARATUS FOR PRODUCING CIGARETTE BACK
Express Mail Label No.	EJ620981272US

**APPLICATION ELEMENTS**

See MPEP chapter 600 concerning utility patent application contents.

1.  \* Fee Transmittal Form (e.g., PTO/SB/17)  
(Submit an original and a duplicate for fee processing)

2.  Specification [Total Pages 17]  
(preferred arrangement set forth below)

- Descriptive title of the Invention
- Cross References to Related Applications
- Statement Regarding Fed sponsored R & D
- Reference to Microfiche Appendix
- Background of the Invention
- Brief Summary of the Invention
- Brief Description of the Drawings (if filed)
- Detailed Description
- Claim(s)
- Abstract of the Disclosure

3.  Drawing(s) (35 U.S.C. 113) [Total Sheets 6]

4. Oath or Declaration [Total Pages 2]

- a.  Newly executed (original or copy)
- b.  Copy from a prior application (37 C.F.R. § 1.63(d))  
(for continuation/divisional with Box 16 completed)
  - i.  DELETION OF INVENTOR(S)  
Signed statement attached deleting  
inventor(s) named in the prior application,  
see 37 C.F.R. §§ 1.63(d)(2) and 1.33(b).

**\* NOTE FOR ITEMS 1 & 13: IN ORDER TO BE ENTITLED TO PAY SMALL ENTITY FEES, A SMALL ENTITY STATEMENT IS REQUIRED (37 C.F.R. § 1.27), EXCEPT IF ONE FILED IN A PRIOR APPLICATION IS RELIED UPON (37 C.F.R. § 1.28).**

ADDRESS TO: Assistant Commissioner for Patents  
Box Patent Application  
Washington, DC 20231

5.  Microfiche Computer Program (Appendix)

6. Nucleotide and/or Amino Acid Sequence Submission  
(if applicable, all necessary)

- a.  Computer Readable Copy
- b.  Paper Copy (identical to computer copy)
- c.  Statement verifying identity of above copies

**ACCOMPANYING APPLICATION PARTS**

7.  Assignment Papers (cover sheet & document(s))

8.  37 C.F.R. § 3.73(b) Statement  Power of  
(when there is an assignee)  Attorney

9.  English Translation Document (if applicable)

10.  Information Disclosure Statement (IDS)/PTO-1449  Copies of IDS  
Statement (IDS)/PTO-1449  Citations

11.  Preliminary Amendment

12.  Return Receipt Postcard (MPEP 503)  
(Should be specifically itemized)

13.  Small Entity Statement(s)  Statement filed in prior application,  
(PTO/SB/09-12)  Status still proper and desired

14.  Certified Copy of Priority Document(s)  
(if foreign priority is claimed)

15.  Other: \_\_\_\_\_

16. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment.

Continuation  Divisional  Continuation-in-part (CIP) of prior application No. \_\_\_\_\_ / \_\_\_\_\_

Prior application information. Examiner \_\_\_\_\_

Group / Art Unit: \_\_\_\_\_

For CONTINUATION or DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 4b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

**17. CORRESPONDENCE ADDRESS**

<input type="checkbox"/> Customer Number or Bar Code Label  (Insert Customer No. or Attach bar code label here)	or <input checked="" type="checkbox"/> Correspondence address below		
Name	ABELMAN FRAYNE & SCHWAB Attorneys at Law 150 East 42nd Street New York, NY 10017		
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Name (Print/Type)	Michael T. Markowitz	Registration No (Attorney/Agent)	30,659
Signature			Date Sep. 15, 2000

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# FEE TRANSMITTAL

## for FY 1999

Patent fees are subject to annual revision.

Small Entity payments must be supported by a small entity statement, otherwise large entity fees must be paid. See Forms PTO/SB/09-12. See 37 C.F.R. §§ 1.27 and 1.28.

TOTAL AMOUNT OF PAYMENT (\$ 730.00)

Complete if Known	
Application Number	
Filing Date	September 15, 2000
First Named Inventor	Heinz FOCKE
Examiner Name	
Group / Art Unit	
Attorney Docket No.	204,758

## METHOD OF PAYMENT (check one)

1.  The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:

Deposit Account Number

01-0035

Deposit Account Name

ABELMAN, FRAYNE &amp; SCHWAB

 Charge Any Additional Fee Required Under 37 CFR §§ 1.16 and 1.172.  Payment Enclosed: Check     Money     Order     Other

## FEE CALCULATION

## 1. BASIC FILING FEE

Large Entity Small Entity

Fee Code (\$)	Fee Code (\$)	Fee Description	Fee Paid
101 760	201 380	Utility filing fee	690.00
106 310	206 155	Design filing fee	
107 480	207 240	Plant filing fee	
108 760	208 380	Reissue filing fee	
114 150	214 75	Provisional filing fee	

SUBTOTAL (1) (\$ 690.00)

## 2. EXTRA CLAIM FEES

Total Claims	Extra Claims	Fee from below	Fee Paid
Independent	-20**	=	X =
Claims	- 3**	=	X =
Multiple Dependent			=

\*\*or number previously paid, if greater; For Reissues, see below

Large Entity Small Entity

Fee Code (\$)	Fee Code (\$)	Fee Description
103 18	203 9	Claims in excess of 20
102 78	202 39	Independent claims in excess of 3
104 260	204 130	Multiple dependent claim, if not paid
109 78	209 39	** Reissue independent claims over original patent
110 18	210 9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) (\$ )

## 3. ADDITIONAL FEES

Large Entity	Small Entity	Fee Description	Fee Paid
105 130	205 65	Surcharge - late filing fee or oath	
127 50	227 25	Surcharge - late provisional filing fee or cover sheet	
139 130	139 130	Non-English specification	
147 2,520	147 2,520	For filing a request for reexamination	
112 920*	112 920*	Requesting publication of SIR prior to Examiner action	
113 1,840*	113 1,840*	Requesting publication of SIR after Examiner action	
115 110	215 55	Extension for reply within first month	
116 380	216 190	Extension for reply within second month	
117 870	217 435	Extension for reply within third month	
118 1,360	218 680	Extension for reply within fourth month	
128 1,850	228 925	Extension for reply within fifth month	
119 300	219 150	Notice of Appeal	
120 300	220 150	Filing a brief in support of an appeal	
121 260	221 130	Request for oral hearing	
138 1,510	138 1,510	Petition to institute a public use proceeding	
140 110	240 55	Petition to revive - unavoidable	
141 1,210	241 605	Petition to revive - unintentional	
142 1,210	242 605	Utility issue fee (or reissue)	
143 430	243 215	Design issue fee	
144 580	244 290	Plant issue fee	
122 130	122 130	Petitions to the Commissioner	
123 50	123 50	Petitions related to provisional applications	
126 240	126 240	Submission of Information Disclosure Stmt	
581 40	581 40	Recording each patent assignment per property (times number of properties)	
146 760	246 380	Filing a submission after final rejection (37 CFR § 1.129(a))	
149 760	249 380	For each additional invention to be examined (37 CFR § 1.129(b))	

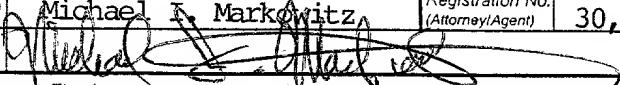
Other fee (specify) \_\_\_\_\_

Other fee (specify) \_\_\_\_\_

Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$ 40.00)

## SUBMITTED BY

Name (Print/Type)	Michael I. Markowitz	Registration No. (Attorney/Agent)	30,659	Telephone	(212) 949-9022
Signature		Date	Sep.15, 2000		

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: FOCKE

EXAMINER:

APPLICATION NO.:

ART UNIT:

FILED: HEREWITH

FOR: PROCESS AND APPARATUS FOR PRODUCING CIGARETTE  
PACKS

PRELIMINARY AMENDMENT

Hon. Commissioner of Patents and Trademarks  
Washington, D.C. 20231

SIR:

STATEMENT OF FILING BY EXPRESS MAIL (37 CFR § 1.10)

This correspondence is being deposited with the United States Postal Service on  
September 15, 2000 in an envelope as "Express Mail Post Office to Addressee" Mailing  
Label Number EJ 620 981 272 US addressed to the Commissioner of Patents and  
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SEP 15 2000  
EX-MAIL

Prior to calculation of the filling fee and prior to examination, please amend the above-identified application as follows:

**IN THE CLAIMS**

Please amend claims 5 and 12 as follows:

Claim 5, line 1: please delete "3 or 4," and please substitute --3,--.

Claim 12, line 1: please delete "10 or 11," and please substitute --10,--.

Please add new claims 14-16 as follows:

--14. Apparatus according to claim 4, characterized by the following features:

- a) during transport along the horizontal conveying path (28, 29),  
the packs (10) of the top pack row (22) can be conveyed in the  
upward direction such that the packs (10) of the top pack row  
(22) can be conveyed over a heating element - heating plate (33)  
- assigned to the packs (10) of the bottom pack row (23),

- b) the heating plate (33) has an obliquely directed run-on surface (40) for the packs (10) of the top pack row (22),
- c) the run-on surface (40) extends across the full (transverse) extent of the packs (10),
- d) the run-on surface (40) has an oblique edge (47) as a boundary.

15. Apparatus according to Claim 11, characterized in that the heating element (71) is of multilayered construction, heating wires (73), on the one hand, and a temperature sensor (76), on the other hand, being positioned between a plurality of mats (74, 75, 77), and the layers, namely metal plate (72) and mats (74, 75, 77), being connected to one another to form a unit by adhesive bonding or vulcanization.

16. Apparatus according to Claim 15, characterized in that the unit-design heating element (71) is positioned within a recess (70) of the heating plate (32, 33) by way of a moldable embedding compound (79), in particular made of silicone.--

REMARKS

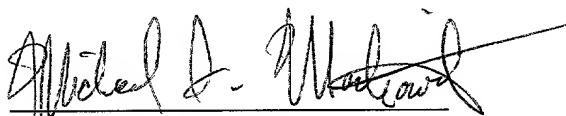
The claims have been amended by amending claims 5 and 12 and adding new claims 14-16. Claims 1-16 remain pending in the application.

Claims 5 and 12 have been amended to change claims 5 and 12 from multiple dependent claims to single dependent claims. New claims 14, 15, and 16 restate claims 5, 12, and 13, respectively, insofar as claim 5 was dependent from claim 4, claim 12 was dependent from claim 11, and claim 13 was dependent from claim 11 (through claim 12) prior to this amendment.

It is respectfully requested that all amendments be entered prior to the calculation of the filing fee so that the applicants are not surcharged for the multiple dependency of claims 5 and 12 prior to this amendment.

Please charge any deficiency or other fees due to Deposit Account No. 01-0035.

Respectfully submitted,



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## Process and apparatus for producing cigarette packs

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### , Description

The invention relates to a process for producing packs with an outer wrapper made of film, in particular hinge-lid boxes for cigarettes, a film blank which is folded around the pack having folding tabs which are connected to one another by thermal sealing. The invention also relates to an apparatus for carrying out the process.

Cigarette packs, in particular hinge-lid boxes, are usually constructed such that an outer wrapper made of film encloses the pack. Folding tabs of the outer wrapper, in the region of a narrow side wall and in the region of the end wall and base wall, are connected to one another by thermal sealing.

The quality, namely the outer appearance, of cigarette packs has to meet ever more stringent requirements. This also applies to the outer wrapper of the cigarette pack, in particular hinge-lid box.

Accordingly, the object of the invention is to propose measures, for the treatment of the pack provided with an outer wrapper made of film, which improve the outer appearance of the

outer wrapper, in particular in the case of hinge-lid boxes for cigarettes.

In order to achieve this object, the process according to the invention is characterized by the following features:

a) during the production of packs of the hinge-lid type, said packs are transported in a plurality of, in particular two, pack rows arranged one above the other along a straight conveying path for the purpose of sealing laterally directed folds in the region of end wall and base wall,

b) following the sealing of the end walls and base walls, the cyclically transported pack rows are subjected to heat treatment in the vicinity of the conveying path, preferably (only) in the region of the upward-facing front sides of the packs.

According to the process of the invention, the thermal sealing of folding tabs and a shrinkage process are thus carried out in successive steps in the region of a straight conveying path. The shrinkage process is preferably carried out such that heat for shrinking is applied merely to the upwardly directed front sides of the packs or film.

In the case of the apparatus according to the invention, the packs are conveyed, preferably discontinuously, through the sealing station and the following shrinking station in two pack rows located one above the other. In this case, the upwardly directed front sides of the packs are subjected to heat treatment by way of the abutment of heating plates. According to the invention, the top pack row is raised slightly in the region of the shrinking station, with the result that a heating element, in particular a heating plate, can act in the region of the bottom pack row.

A further special feature of the invention is the design of the heating plates such that a very rapid, effective change in the heating temperature is made possible. As a result, the heating and/or shrinking station can be quickly adapted to different operating states of the packaging machine, in particular to different conveying speeds.

Further features of the process according to the invention and of the apparatus according to the invention are explained in more detail hereinbelow with reference to the drawings, in  
5 which:

Figure 1 shows a schematic side view of a (film-) packaging machine,

10 Figure 2 shows, on an enlarged scale and partially in vertical section, a side view of the region of a sealing and shrinking station of the packaging machine,

15 Figure 3 shows a plan view of the region of the sealing and shrinking station,

Figure 4 shows a cross section through the shrinking station from Figure 3 along section plane IV-IV,

20 Figure 5 shows, on an enlarged scale, a detail from Figure 4 with elements in different positions relative to one another,

25 Figure 6 shows likewise a cross section through the shrinking station with movable elements in yet different positions relative to one another,

Figure 7 shows, on an enlarged scale, a detail of a shrinking and/or heating plate in vertical section, and

30 Figure 8 shows a horizontal section of the detail according to Figure 7 along section plane VIII-VIII.

The exemplary embodiment illustrated in the drawings concerns the handling of cuboidal packs 10, namely hinge-lid boxes (hinge-lid packs) for cigarettes. This type of pack comprises a (bottom) box part 11 and a lid 12 connected thereto. The pack is enclosed by an outer wrapper 13 made of film. The latter is folded such that in particular envelope-design folding tabs are produced in the region of the end wall 14 and base wall 15, said folding tabs partially overlapping one another and being connected to one another by thermal sealing.

The outer wrapper 13 or blank for forming the same is prepared in a film-packaging machine according to Figure 1 - a so-called cello - and is positioned around the otherwise finished pack 10. For this purpose, the blanks of the outer wrapper 13 are severed from a film web in the region of a blank subassembly 17 and are fed to the packs 10, which are transported in a horizontal plane. A folding turret 18 folds the outer wrapper 13 around the pack 10. In the region of a horizontal pack path, the packs 10 leave the folding turret 18. The packs 10 which have been completed with regard to the outer wrapper 13 are transferred to a vertical conveyor 20, which feeds the packs 10, arranged one above the other, to a push-off path 21.

In the region of said push-off path 21, a multilayered formation of the packs 10 is formed, in the present example with two pack rows 22, 23 one above the other. For this purpose, the packs 10 are pushed off cyclically in pairs from the upright grouping by a pusher 24.

As seen in the conveying direction of the packs 10, first of all a sealing station 25 and then a shrinking station 26 are formed in the region of the push-off path 21. Accordingly, the packs 10 or the pack rows 22, 23 are first of all subjected to sealing treatment in the region of the end wall 14 and base wall 15 and then to shrinkage treatment, both treatments involving heat being fed.

In the region of the push-off path 21, the pack rows 22, 23 rest on a track plate 27 extending in the longitudinal direction. The latter is considerably narrower than the dimension or height of the packs 10, which are oriented in the transverse direction. In the case of the exemplary embodiment illustrated, the apparatus is set up for double-path operation, that is to say with two parallel conveying paths 28, 29 one beside the other. Said two conveying paths are of largely corresponding design in the region of the push-off path 21. The elements assigned to the conveying paths 28, 29 operate cyclically and at the same time for the two conveying paths 28, 29.

The first region, as seen in the conveying direction, of the push-off path 21 is the sealing station 25. In this region, sealing elements, namely lateral sealing jaws 30, 31, are

positioned on both sides of the pack rows 22, 23, said elements being directed towards the facing end walls 14 and base walls 15 of the packs 10. The sealing jaws 30, 31 can preferably be moved transversely to the conveying direction of the packs 10 such that the sealing jaws 30, 31 are drawn back during a conveying cycle of the packs 10 and butt against the end wall 14 and base wall 15 during a standstill phase of the packs 10, heat being transmitted for the purpose of sealing the folding tabs in the process.

10

In the region of the shrinking station 26, heat is transmitted to the large-surface-area sides of the packs 10. In the present case, the shrinking station 26 is set up such that heat is transmitted only to the upwardly directed front sides of the packs 10. For this purpose, the shrinking station 26 has sheet-like heating elements, namely a top heating plate 32 and a bottom heating plate 33. The heat is transmitted by the heating plates 32, 33 butting against the top sides (front sides) of the packs 10. A special feature is that the bottom heating plate 33 is positioned in the region between the pack rows 22, 23. For this purpose, the packs 10 of the top pack row 22 are raised in the region of the heating plates 32, 33, with the result that the packs are conveyed above the bottom heating plate 33. Each heating plate 32, 33 comprises a (top) carrying plate 34, 35 and a sheet-like heating element 36, 37 provided on the underside of the same in each case. The heating elements, in this case, are electrical resistance-heating means which are supplied with power via lines 38, 39. During transportation of the packs 10, the heating plates 32, 33 are raised from the associated packs 10; during the heating and/or shrinking phase, the relevant heating plates 32, 33 and the heating elements 36, 37 thereof butt against the top side of the packs 10.

35 The packs 10 are moved on, by the cyclic advancement, by in each case one conveying cycle corresponding to the dimension of the packs 10. The bottom or central heating plate 33 is provided with an inclined run-on surface 40 which makes it easier for the packs 10 of the top pack row 22 to be pushed onto the bottom heating plate 33. In order to ensure correct advancement of the packs, the latter, in a region in front of the shrinking station 26, are subjected to loading by an

elastic holding-down means 41 comprising a plurality of brushes 42.

In order for the packs 10 to be pushed onto the bottom heating plate 33 during the advancement, the pack 10 which is located in each case in a position in front of the heating plate 33 is displaced in the transverse direction onto a laterally arranged ramp 43, which is of wedge-like design in the conveying direction. The relevant pack 10 is displaced in the transverse direction out of the top pack row 22 by a transverse pusher 44 and then, during further transportation in the offset position, passes onto the laterally arranged ramp 43. This makes it easier for the packs to be pushed onto the heating plate 33. A side guide 45 is designed such that, during further transportation, the pack 10 resting first of all with a front region on the heating plate 33, on the one hand, passes in its entirety onto the heating plate 33 and, at the same time, is moved back in the transverse direction into the starting position, that is to say aligned within the pack row 22. The pack rows 22, 23 are also retained in a precise relative position on the opposite side by side guides 46. In order to facilitate the pushing-on action, the bottom heating plate 33 is provided, in plan view, with an obliquely running edge 47 as an initial boundary of the run-on surface 40. Following the heating and/or the shrinking operation, the packs 10 of the top pack row 22 run downwards, via a likewise obliquely directed end surface 48 of the heating plate 33, until they butt against the respectively associated pack 10 of the bottom pack row 23.

The heating plates 32, 33 can be moved up and down by a specific actuating mechanism. The latter acts on the top heating plate 32 which, for its part, transmits the movements to the bottom heating plate 33. By virtue of the mobility of heating plates 32, 33 in the upward direction, a smooth, frictionless feeding of the pack rows 22, 23 is possible in each case.

For this purpose, the heating plates 32, 33 are subjected to loading by springs. The top heating plate 32 has (four) compression springs 49. These are supported, on the one hand, on the top side of the heating plate 32 and, on the other hand, on a supporting plate 50. The latter is arranged in a fixed manner. The compression springs 49 are prestressed such that,

when relieved of loading, the heating plate 32 is pressed downwards by the compression springs 49 until it butts against the pack 10 (Figure 6, on the left). For the purpose of raising the heating plate 32, the latter is moved upwards and raised from the pack 10 with the compression springs 49 being compressed (Figure 6, on the right).

The bottom heating plate 33 is actuated by two groups of in each case a plurality of (four) springs. Top lowering springs 51 are supported at the top on an extension of the top heating plate 32, on the one hand, and on the top side of the bottom heating plate 33, on the other hand. During lowering of the top heating plate 32, pressure is thus transmitted to the bottom heating plate 33 via the lowering springs 51, with the result that said heating plate is correspondingly lowered until it butts against the pack 10. During the upward movement of the top heating plate 32, the lowering springs 51 are relieved of stressing (Figure 6, on the right). The bottom heating plate 33 is raised by lifting springs 52 which are supported, on the one hand, on the underside of the bottom heating plate 33 and, on the other hand, on a fixed bearing, in the present case in a recess of the side guides 45, 46. The lifting springs 52 are compressed during the downward movement of the heating plates 32, 33. During the upward movement, that is to say relief from loading, said lifting springs 52 raise the bottom heating plate 33 from the bottom pack 10 (Figure 6, on the right).

Transversely movable actuating levers 53, 54 are provided as actuating element. By virtue of transverse movement, they transmit the actuating forces to the heating plates, in the present case to the top heating plate. The arrangement here is such that, as described, the top heating plate is moved upwards by the actuating levers 53, 54 for the purpose of releasing the packs 10. For this purpose, a transversely directed leg 55 of the actuating levers 53, 54 is provided with a wedge surface 56. During transverse movement of the actuating levers 53, 54, said wedge surface transmits a lifting force to the top heating plate 32. For this purpose, a supporting roller 57 is connected to the top heating plate 32 in the region of the actuating levers 53, 54, said supporting roller, in turn, being fastened on the heating plate 32 via a web 58. The supporting roller 57 runs on the wedge surface 56. The arrangement is such that, as the actuating levers 53, 54 move sideways away from the packs,

the supporting rollers 57 and thus the heating plate 32 are raised.

The (four) actuating levers 53, 54 are actuated by connecting rods 59, 60. These are directed horizontally and can be moved back and forth by an actuating element (not shown). If the apparatus is of double-path configuration, in each case two corresponding actuating levers 53 are connected to the associated connecting rod 59 and the other actuating levers 54 are connected to the other connecting rod 60, located therebeneath. The connecting rods 59, 60 are guided, via slide bearings 61, through those actuating levers 53, 54 which are not actuated, that is to say displaced, by the relevant connecting rod 59, 60.

The movements are coordinated with one another such that the transverse pusher 44 is connected to one of the actuating levers 53, that is to say is actuated by the same. Furthermore, the holding-down means is connected to the supporting plate 50 and is thus likewise fixed.

For the supply of the heating elements 36, 37, the electric lines 38, 39 lead to connection lines 62, 63 which are routed above and beneath the conveying paths 28, 29.

In the case of the present exemplary embodiment, the top heating plates 32 can be raised for cleaning and maintenance purposes. For this purpose, the top heating plates 32 of the two conveying paths 28, 29 are connected to a transversely directed lifting arm 64. The latter is designed as a single-armed lever and can be pivoted about a bearing 65. A freely projecting handle 66 is arranged on the opposite side. By virtue of appropriate activation, the lifting arm 64 can be moved upwards into an oblique position (dashed position in Figure 4). The important structural parts at the top of the heating plate 32, including the holding-down means 41, are connected to the lifting arm 64. The lifting arm 64 can be connected to a connecting leg 67 of a firmly anchored crossmember 68 running beneath the conveying paths 28, 29.

The correct movement of the packs 10 as they are pushed off from the bottom heating plate 33 is ensured by an obliquely directed and/or arcuate guide shoe 69.

An (independent) special feature is the configuration of the heating elements, namely of the heating plates 32, 33 (Figures 7 and 8). The carrying plates 34, 35 have a recess 70 which is enclosed by a border and is open in the downward direction in each case. In each case one sheet-like heating element 71 is positioned in said recess, with the result that, in the case of the present example, said heating element acts in the downward direction, that is to say it acts on a pack 10 positioned beneath the heating element 71.

In the downward direction, or on the side directed towards the pack 10, the heating element 71 has a metal plate 72, in particular made of steel. The metal plate 72 is of comparatively thin design, namely with a thickness of, for example, 0.5 mm, with the result that quick heat transmission is ensured. Heating elements are positioned on the inside of the metal plate 72, or on that side of said plate which is directed away from the pack 10. Said heating elements are constituted by an electrical heating wire 73 which is positioned in loops, for example in meandering form. The heating wire is connected to a power source via the lines 38, 39. The heating wire 73 produces the necessary heating temperature in a surface region.

The heating wire 73 is embedded or positioned between layers made of suitable material, namely between a bottom mat 74 and a top mat 75. These mats 74, 75 consist of suitable material, in particular silicone with fibre and/or fabric reinforcement. The mats 74, 75 are suitable for the heat transmission.

Arranged above the mat 75, or on the side which is directed away from the heating wire 73, is a temperature sensor 76 which is covered and/or insulated from the carrying plate 34, 35 by a further mat 77. With the aid of the temperature sensor 76, it is possible to determine the temperature present in the region of the heating plate 32, 33 and then to change said temperature if appropriate. The temperature sensor 76 is connected to a suitable control unit via a line 78.

The metal plate 72, the heating wire 73 and the mats 74, 75 and, if appropriate, the temperature sensor 76 and the mat 77 form a cohesive unit. The individual layers are connected to

one another, to be precise, in particular, by the silicone and metal layers being adhesively bonded or vulcanized to one another. Said unit is positioned in the recess 70 and anchored there by way of a suitable compound, in particular by way of an embedding compound 79 made of silicone.

Using a heating element 71 designed in this way and/or corresponding heating plates 32, 33, quick, immediate adaptation of the effective heating temperature to certain operating states is possible since the thin, virtually foil-like metal plate 72 transmits the temperature virtually without delay. As a result, in the case of an "immediate stop" of the machine with a continuing run of approximately three packs, the outer wrapper does not burn because the heating plates 32, 33, by virtue of connection to a central control unit, are switched off right away and are also cooled immediately by the incoming packs.

Adaptation to the operating states of the machine is such that, during a standstill, a temperature of 80°C and, at a maximum conveying speed of, for example, 365 packs per minute, a temperature of 135°C is produced, with correspondingly lower temperatures for lower production capacities.

Alternatively, it is also possible for the apparatus to be designed such that the two large-surface-area sides of the packs 10, that is to say the front side and rear side, are subjected to the action of heat. In this case, the bottom heating plate 33 is to be designed such that a heating element is arranged on the top side as well.

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Patent claims

1. Process for producing packs (10) with an outer wrapper (13) made of film, in particular hinge-lid boxes for cigarettes, a film blank which is folded around the pack (10) having folding tabs which are connected to one another by thermal sealing, it being the case that, following the thermal sealing, the film is subjected to heat treatment for the purpose of shrinking the film, **characterized by** the following features:
  - 10 a) during the production of packs (10) of the hinge-lid type, said packs are transported in a plurality of, in particular two, pack rows (22, 23) arranged one above the other along a straight conveying path for the purpose of sealing laterally directed folds in the region of end wall (14) and base wall (15),
  - 15 b) following the sealing of the end walls (14) and base walls (15), the cyclically transported pack rows (22, 23) are subjected to heat treatment in the vicinity of the conveying path, preferably (only) in the region of the upward-facing front sides of the packs (10).
- 20

2. Process according to Claim 1, **characterized by** the following features:

5 a) the packs (10) of the top pack row (22) are raised in the region of a shrinking station (26) for the purpose of positioning a (bottom) heating plate (33) between the pack rows (22, 23).

10 b) by means of a top heating plate (32) and a bottom heating plate (33) positioned between the pack rows (22, 23), heat is directed downwards in each case only onto the facing (front) side of the packs (10).

15 3. Apparatus for producing packs (10) with an outer wrapper (13) made of film, in particular hinge-lid boxes for cigarettes, a film blank which is folded around the pack (10) having folding tabs which are connected to one another by thermal sealing in the region of a sealing station (25),  
20 **characterized by** the following features:

a) the packs (10) can be transported cyclically along a straight conveying path in a plurality of, in particular two, pack rows (22, 23) arranged one above the other,

25 b) in a first region of the conveying path (28, 29) the latter is configured as a sealing station (25) with sealing jaws (30, 31) arranged at either side of the conveying path (28, 29) for the purpose of sealing the  
30 laterally directed folding tabs,

c) the sealing station (25) is followed in the region of the conveying path (28, 29) by a shrinking station (26) for the purpose of shrinking the outer wrapper (13) through  
35 the application of heat.

4. Apparatus according to Claim 3, **characterized in that** the shrinking station (26) has movable thermal elements, in particular heating plates (32, 33), which, for the purpose of  
40 transmitting heat to the packs (10), can be moved against at

least one side of the packs (10), in particular against an upwardly directed front side of the packs (10).

5. Apparatus according to Claim 3 or 4, **characterized by** the  
5 following features:

- a) during transport along the horizontal conveying path (28, 29), the packs (10) of the top pack row (22) can be conveyed in the upward direction such that the packs (10) of the top pack row (22) can be conveyed over a heating element - heating plate (33) - assigned to the packs (10) of the bottom pack row (23),  
10
- b) the heating plate (33) has an obliquely directed run-on surface (40) for the packs (10) of the top pack row (22),  
15
- c) the run-on surface (40) extends across the full (transverse) extent of the packs (10),  
20
- d) the run-on surface (40) has an oblique edge (47) as a boundary.

6. Apparatus according to Claim 3, **characterized in that** a pack (10) of the top pack row (22) in a position before it runs onto the bottom heating plate (33) in each case can be displaced in the transverse direction onto a laterally arranged ramp (43), and in that, in a further conveying cycle, the pack (10) resting with one side on the ramp (43) can be pushed onto the bottom heating plate (33), preferably with a simultaneous 30 sideways-directed return movement into the starting position.

7. Apparatus according to Claim 3, **characterized in that** the two heating plates (32, 33) can be moved up and down together such that, during the advancement of the packs (10), the heating plates (32, 33) can be raised from the packs (10) of the top pack row (22) and of the bottom pack row (23).  
35

8. Apparatus according to Claim 7, **characterized in that** the heating plates (32, 33) are connected to one another by pressure-exerting elements, in particular by lowering springs (51) and lifting springs (52) for the bottom heating plate  
40

(33), the lowering springs (51) and lifting springs (52) preferably being positioned such that, during an upward movement of the top heating plate (32), the bottom heating plate (33) is raised by the lifting springs (52).

5       9. Apparatus according to Claim 7, **characterized in that** the top heating plate (32) can be moved, in particular lowered, by a transversely movable actuating mechanism, transversely movable actuating levers (53, 54) preferably having wedge surfaces (56) which, via supporting rollers (57) connected to the top heating plate (32), move, preferably raise, the top heating plate (32) counter to the loading of pressing-down elements, in particular compression springs (49).

10      15 10. Apparatus according to Claim 3, **characterized in that** the thermal elements or heating plates (32, 33) have heating elements (71) which have heat-transmitting elements, in particular very thin metal plates (72), which react immediately to changes in temperature, the packs (10) coming into abutment 20 against the same or being capable of being moved past the same at a small distance therefrom.

25      11. Apparatus according to Claim 10, **characterized in that** the heating element (71) has sheet-like heating elements, in particular electrical (resistance-)heating wires (73) which are arranged in loops or in meandering form and, on the side which is directed away from the packs (10), are connected to the metal plate (72) or the like via a heat-conducting intermediate layer, in particular a mat (74) made of silicone.

30      12. Apparatus according to Claim 10 or 11, **characterized in that** the heating element (71) is of multilayered construction, heating wires (73), on the one hand, and a temperature sensor (76), on the other hand, being positioned between a plurality 35 of mats (74, 75, 77), and the layers, namely metal plate (72) and mats (74, 75, 77), being connected to one another to form a unit by adhesive bonding or vulcanization.

40      13. Apparatus according to Claim 12, **characterized in that** the unit-design heating element (71) is positioned within a

recess (70) of the heating plate (32, 33) by way of a moldable embedding compound (79), in particular made of silicone.

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16 August 2000/5912  
FOC-636

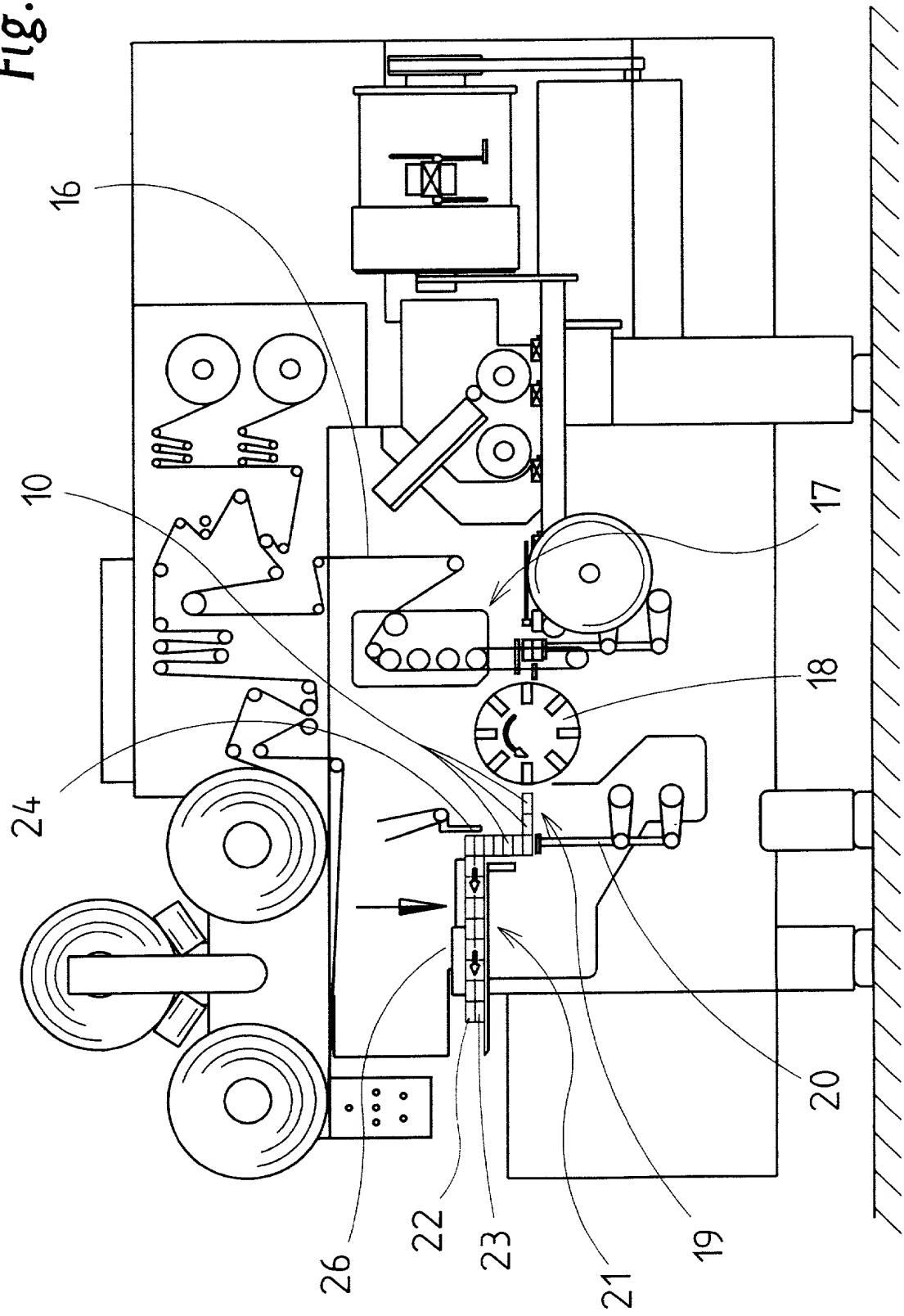
List of designations

10	Pack	47	Edge
11	Box part	48	End surface
12	Lid	49	Compression spring
13	Outer wrapper	50	Supporting plate
14	End wall	51	Lowering spring
15	Base wall	52	Lifting spring
16	Film web	53	Actuating lever
17	Blank subassembly	54	Actuating lever
18	Folding turret	55	Leg
19	Pack path	56	Wedge surface
20	Vertical conveyor	57	Supporting roller
21	Push-off path	58	Web
22	Pack row	59	Connecting rod
23	Pack row	60	Connecting rod
24	Pusher	61	Slide bearing
25	Sealing station	62	Connection line
26	Shrinking station	63	Connection line
27	Track plate	64	Lifting arm
28	Conveying path	65	Bearing
29	Conveying path	66	Handle
30	Sealing jaw	67	Connecting leg
31	Sealing jaw	68	Crossmember
32	Heating plate (top)	69	Guide shoe
33	Heating plate (bottom)	70	Recess
34	Carrying plate (top)	71	Heating element
35	Carrying plate (bottom)	72	Metal plate
36	Heating element	73	Heating wire
37	Heating element	74	Mat
38	Line	75	Mat
39	Line	76	Temperature sensor
40	Run-on surface	77	Mat
41	Holding-down means	78	Line
42	Brush	79	Embedding compound
43	Ramp		
44	Transverse pusher		
45	Side guide		
46	Side guide		

A b s t r a c t  
(in conjunction with Fig. 2)

Process and apparatus for producing cigarette packs.

In order to improve the outer appearance of (cigarette) packs (10) of the hinge-lid-box type, said packs, once an outer wrapper (13) has been provided and sealed, are conveyed through a shrinking station (26) and subjected to the action of heat in the region of the large-surface-area pack sides, in particular in the region of upwardly directed front sides. For this purpose, heating plates (32, 33) are positioned in the region of the shrinking station (26) and transmit heat to the upwardly directed surfaces of the packs (10).

*Fig. 1*

**Fig.2**

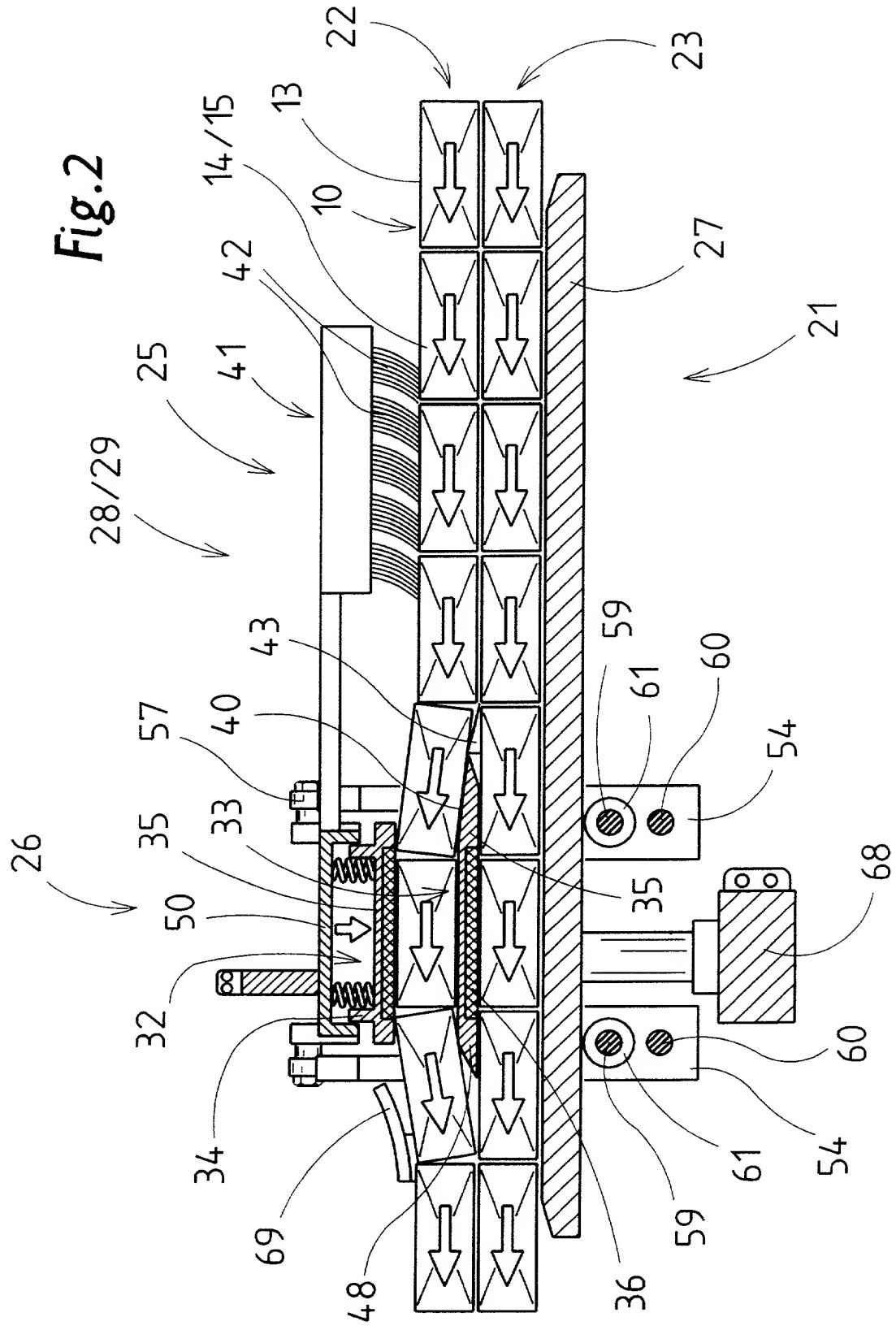


Fig.3

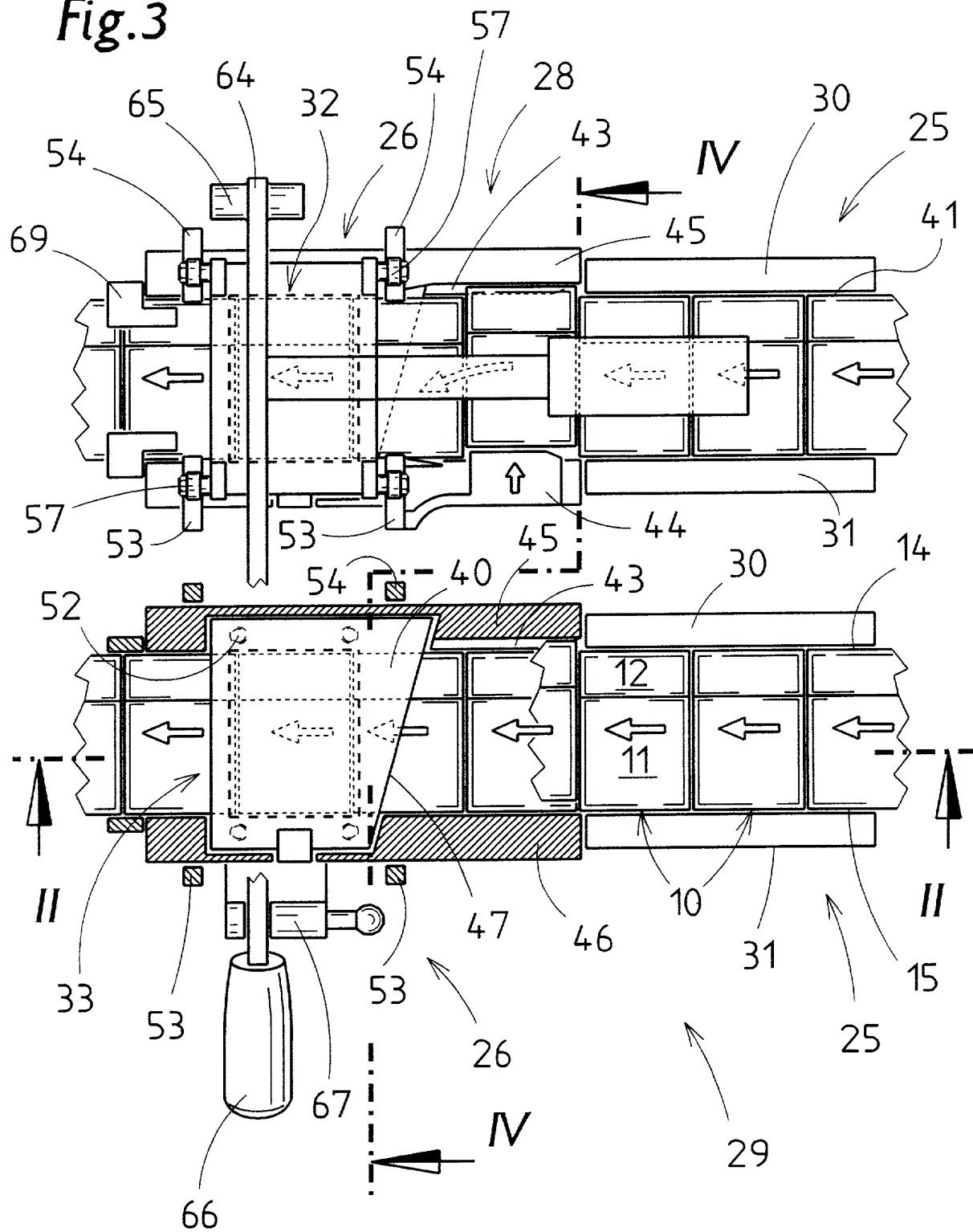
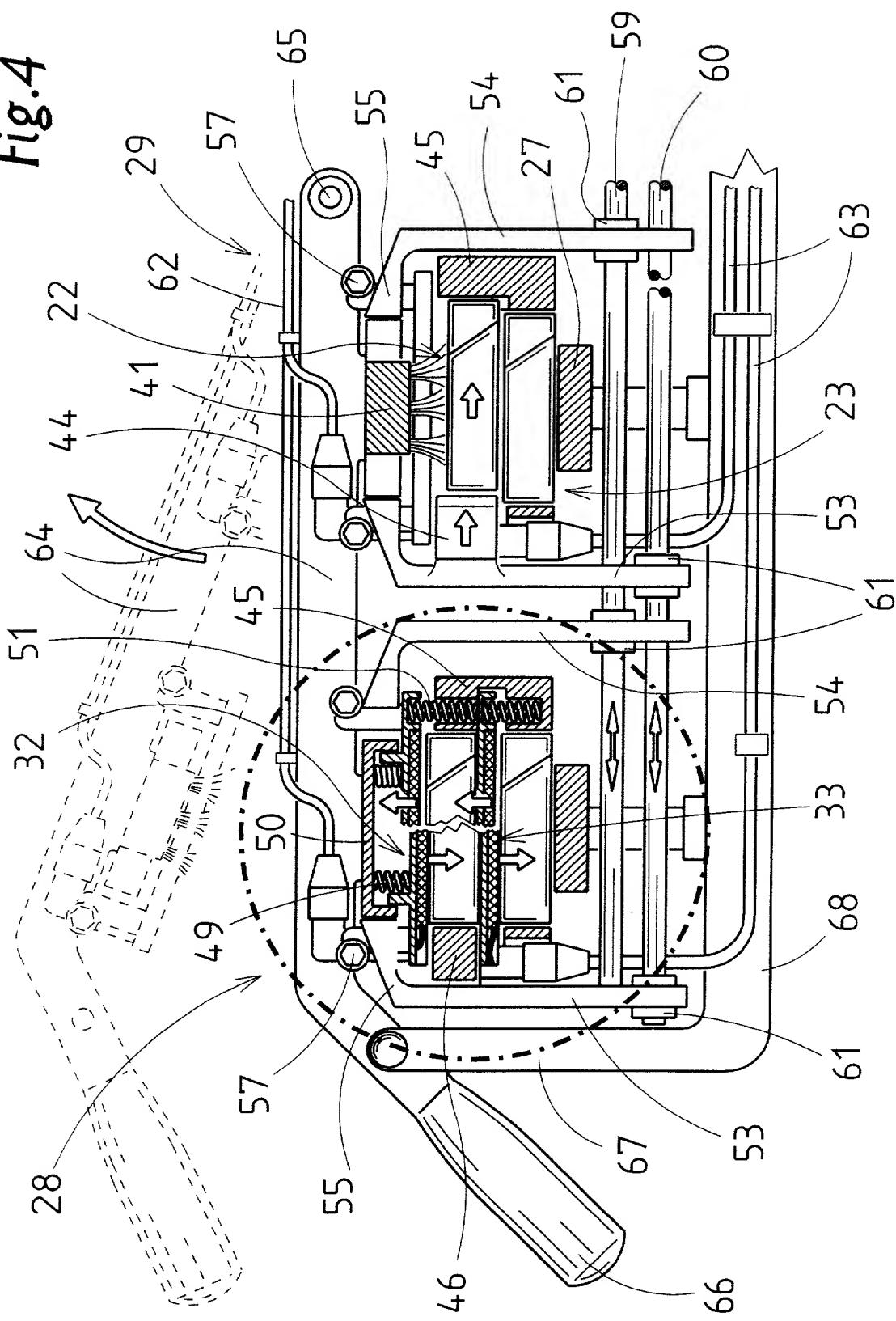
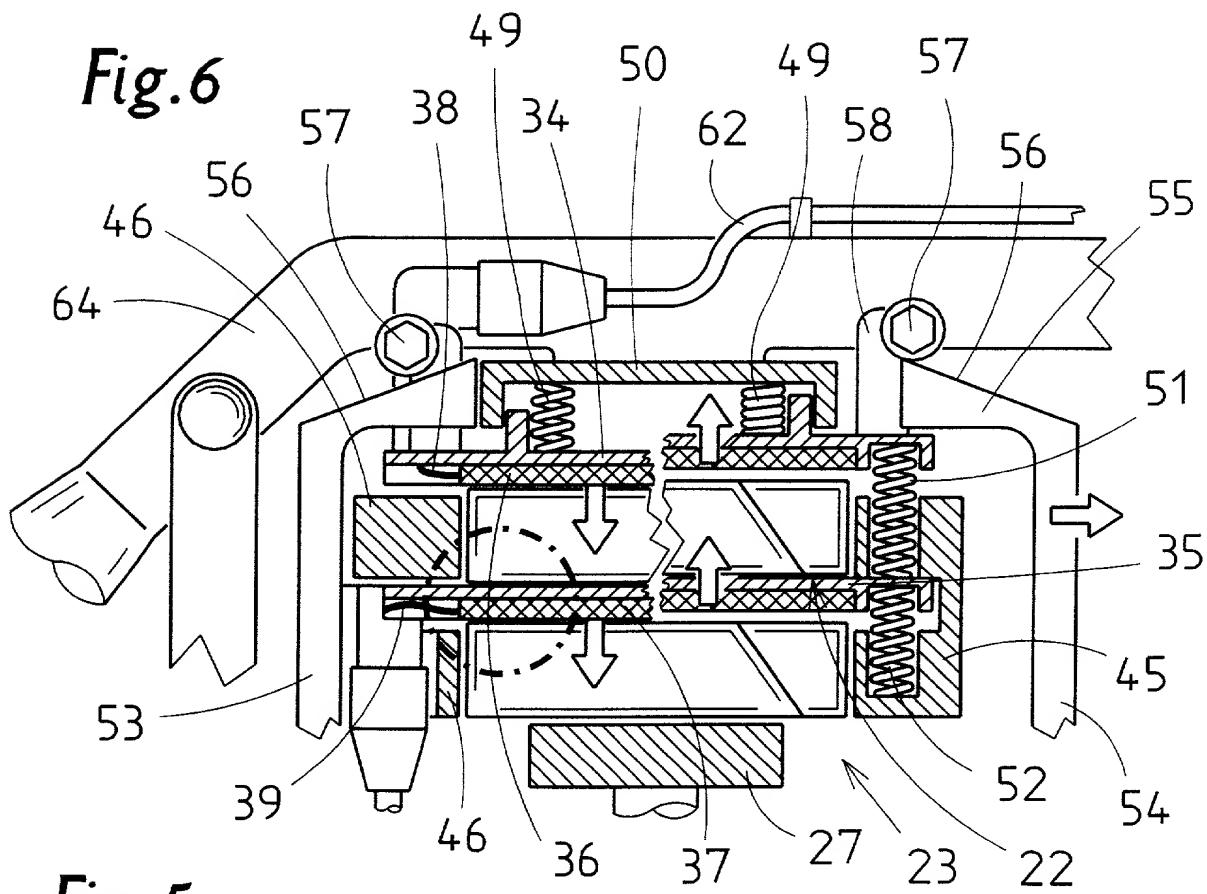
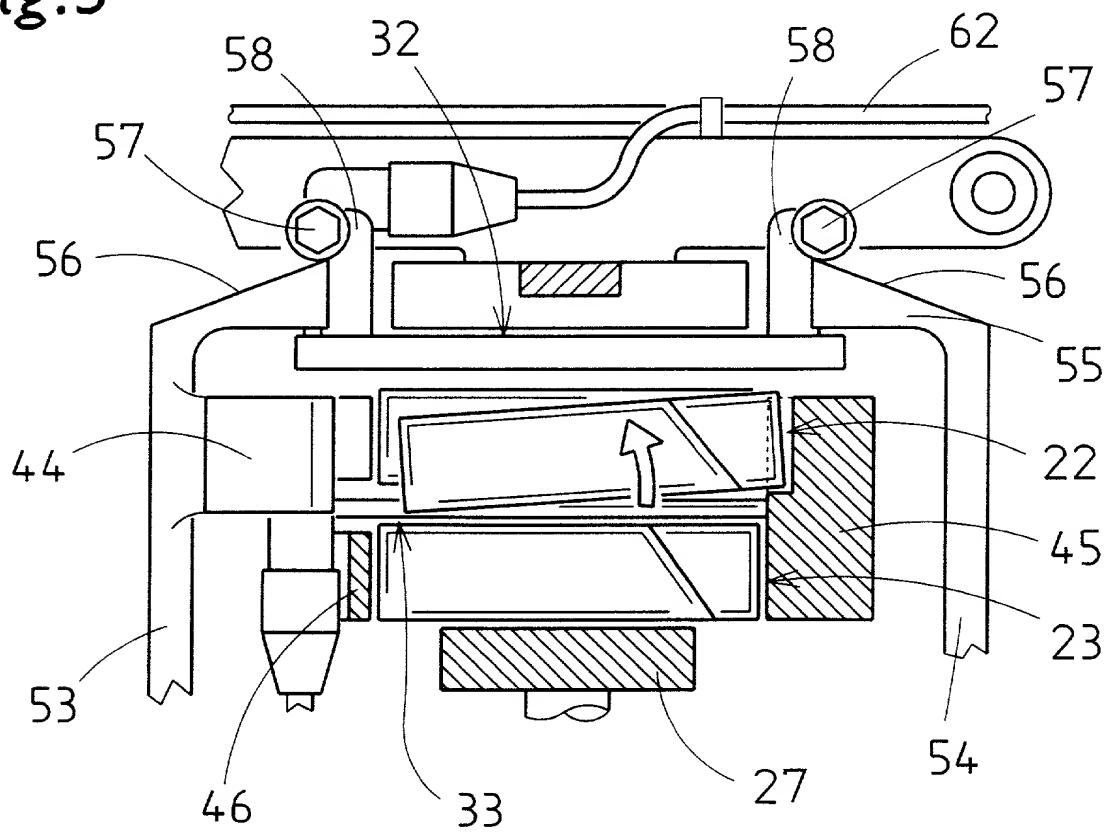
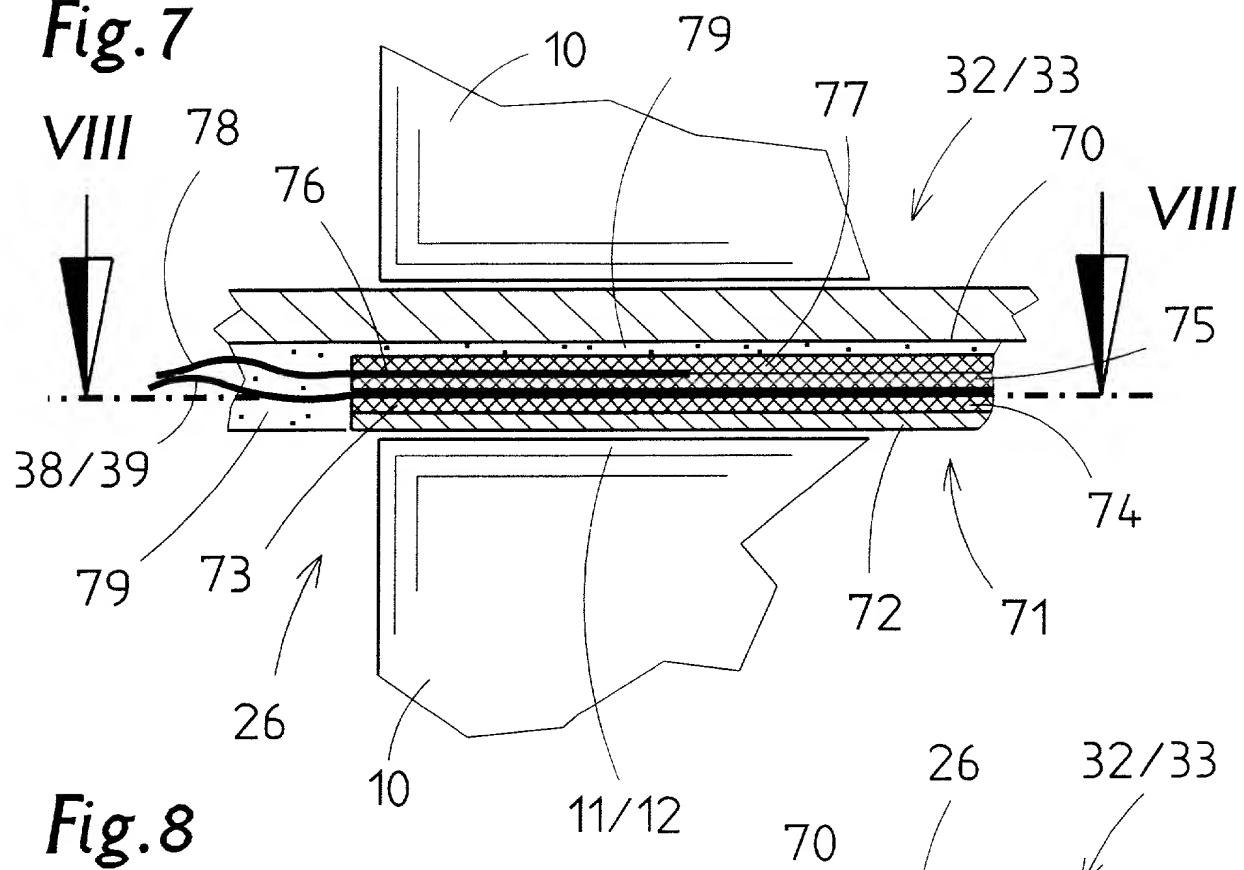
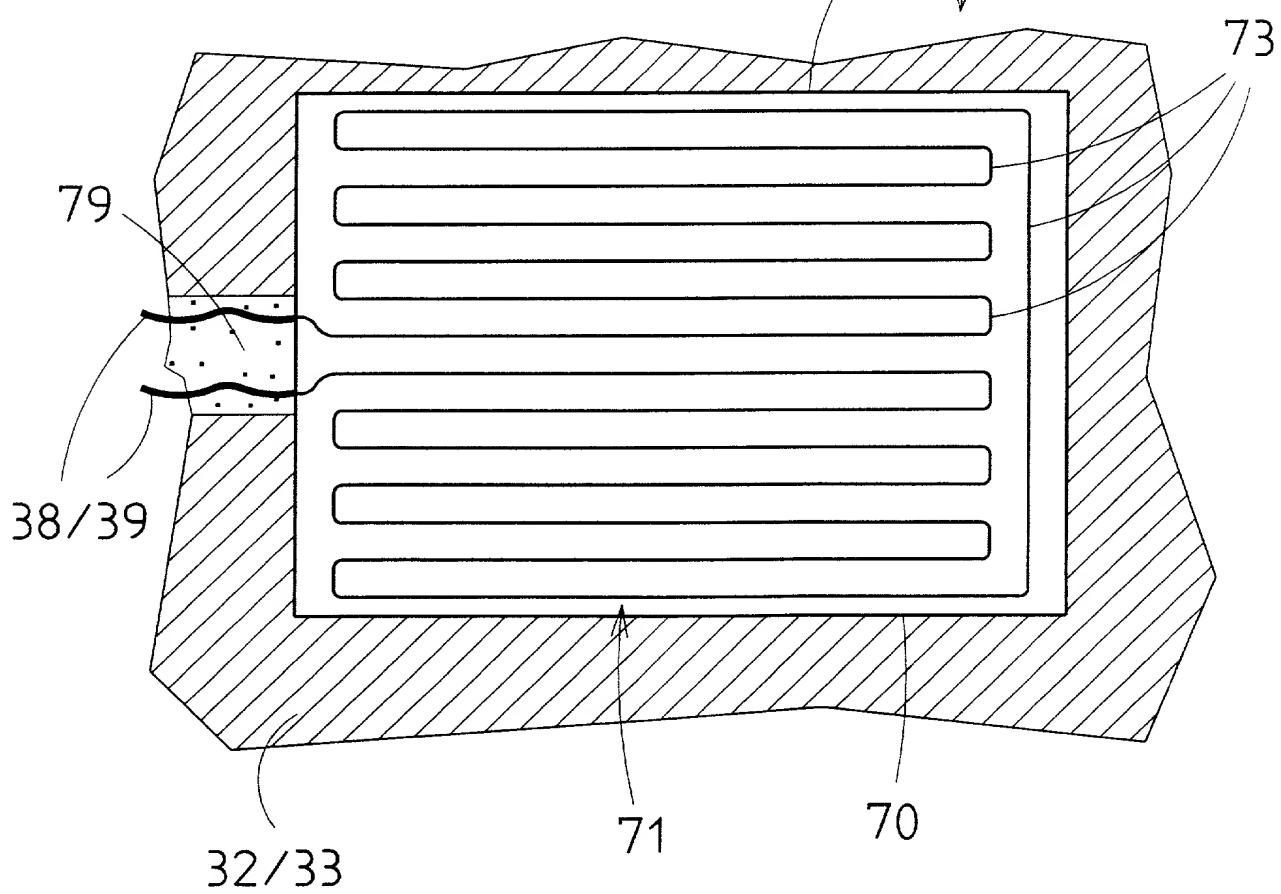


Fig.4



*Fig.6**Fig.5*

**Fig. 7****Fig. 8**

## UNITED STATES

**PATENT APPLICATION  
DECLARATION AND POWER OF ATTORNEY - ORIGINAL APPLICATION**

ATTORNEY'S DOCKET NO.

204,758

As a below named Inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name:

I verily believe I am the original, first and sole inventor (if only one name is listed below) or a joint inventor (if plural inventors are named below) of the invention entitled

(1) Process and apparatus for producing cigarette packs

the specification of which

(2)  is attached hereto.

was filed on \_\_\_\_\_ as Application No. \_\_\_\_\_  
and was amended on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge my duty to disclose information of which I am aware which is material to the examination of this application under 37 CFR 1.56(a); the invention has not been patented or made the subject of a inventor's certificate issued before the date of this application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months prior to this application; and as to applications for patents or inventor's certificate on the invention filed in any country foreign to the United States prior to this application by me or my legal representatives or assigns.

(3)  no such applications have been filed, or

such applications have been filed as follows:

## EARLIEST FOREIGN APPLICATION(S), IF ANY, FILED WITHIN 12 MONTHS PRIOR TO THIS APPLICATION

Country	Application Number	Date of Filing (day, month, year)	Date of Issue (day, month, year)	Priority Claimed Under 35 USC 119
(4) Germany	199 44 086.7	15.09.99		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Germany	199 54 169.8	10.11.99		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

## ALL FOREIGN APPLICATIONS, IF ANY, FILED MORE THAN 12 MONTHS PRIOR TO THIS APPLICATION

(4)				

I hereby claim the benefit under Title 35, United States Code § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

(5) COMPLETE DATA INDICATED IF APPLICABLE

(5) \_\_\_\_\_ (Application Ser. No.) (Filing date) (Status: patented, pending, abandoned)

(5) \_\_\_\_\_ (Application Ser. No.) (Filing date) (Status: patented, pending, abandoned)

**Power of Attorney:** As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

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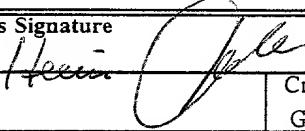
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

(6) DETAILS  
REQUIRED  
FOR EACH  
INVENTOR

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Full Name of Fourth Joint Inventor, If Any	Inventor's Signature	Date
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Full Name of Fifth Joint Inventor, If Any	Inventor's Signature	Date
Residence		Citizenship
Post Office Address		
Full Name of Sixth Joint Inventor, If Any	Inventor's Signature	Date
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